

LINX TECHNOLOGIES WIRELESS MADE SIMPLE

MASTER EVALUATION/DEVELOPMENT SYSTEM

QS Series Master Development System User's Guide



This Guide Covers:

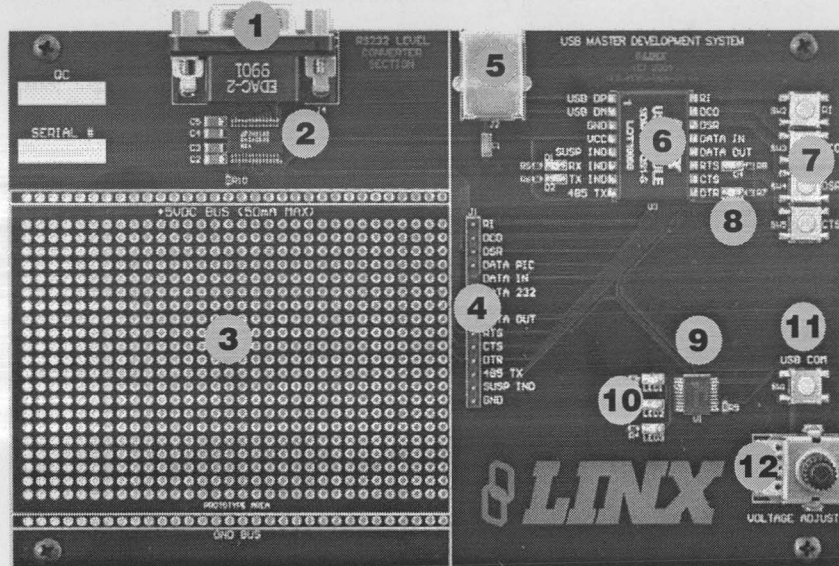
PART #	DESCRIPTION
MDEV-USB-QS	QS Series Master Development System

INTRODUCTION

The Linx QS Series USB module allows the rapid addition of USB to virtually any device. The master evaluation/development system is intended to give a designer all the tools necessary to incorporate the module into an end product. The purpose of this guide is to show the designer how to take full advantage of the master development board included with the kit. The development board serves several important functions:

- **Rapid Module Evaluation** - The kit allows the module's performance to be quickly evaluated.
- **Application Development** - The kit comes with application software and source code that demonstrate how to interface the module with the computer.
- **Design** - The kit shows how to design with the module and to physically interface with other components.
- **Prototyping** - The kit allows for additional circuitry to be placed directly on the board so that it can act as the first prototype of the product.

MDEV-USB-QS DEVELOPMENT BOARD



1. DB9 Connector
2. RS232 Level Converter Chip
3. Prototyping Area
4. Breakout Header
5. USB Jack
6. QS Module
7. Modem Line Buttons
8. Modem Line LEDs
9. Microcontroller
10. Microcontroller LEDs
11. Microcontroller Button
12. Voltage Adjust Potentiometer

GETTING STARTED

There are four areas on the development board: the USB area, the RS232 area, the Microcontroller area, and the Prototyping area. The RS232 area connects the QS module to a standard DB9 serial connector through a RS232 level converter chip. This section allows for full handshaking so that a legacy device can be connected and tested. The microcontroller section connects the QS to a Microchip PIC microcontroller. The included software demonstrates how to interface the QS to the PIC for bi-directional communication with a custom processor. Much of the source code is documented in the software's help file and provides a good foundation upon which to build a custom product.

USB AREA

This section demonstrates how to activate the modem outputs and read the modem inputs. Figure 1 shows the development board and Figure 2 shows the Modem Line section in the development software.

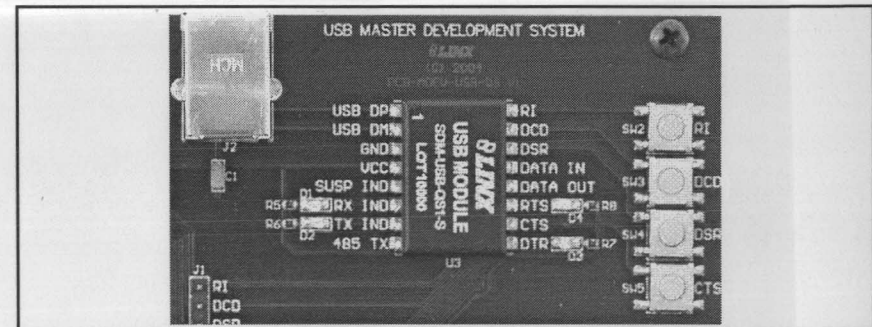


Figure 1: USB Area

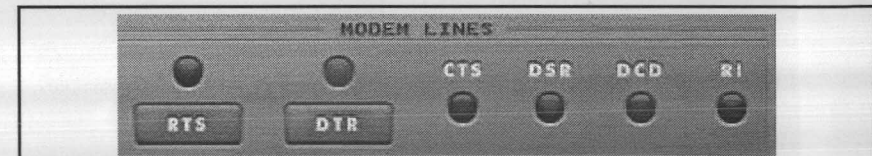


Figure 2: Software Modem Line Section

Pressing the RTS and DTR buttons in the application software will activate the RTS and DTR LEDs on the development board. Pressing the RI, DCD, DSR, or CTS buttons on the board will cause the appropriate indicator on the software screen to light up. The source code for programming this can be found in the software's Help File.

There are two LEDs to the left of the module, one marked TX IND and another marked RX IND. These will flash when the module is sending and receiving data, respectively.

Note that the modem lines are designed to work with UARTs, so the states are inverted. This means that the lines are at Vcc when off and at ground when on.

THE RS232 AREA

The RS232 area contains a RS232 level converter that, when used with the QS Series module, creates a USB-to-RS232 converter. All of the modem lines are provided to allow for full handshaking, and power is provided by the USB bus. To use, simply plug the USB cable from the PC into the jack, a straight through serial cable from the PC into the DB9 connector, place the jumper in the breakout header between "Data In" and "Data 232" and you may now run the software.

The development software is designed so that testing can be done with a single PC by sending data through the USB bus and receiving it back through the serial port and vice versa. This section can also be used to interface the PC with any RS232 device. Custom software can be written to control the device directly, or the Virtual COM Port drivers can be used to make the USB module look like an additional serial port so that existing software can be used.

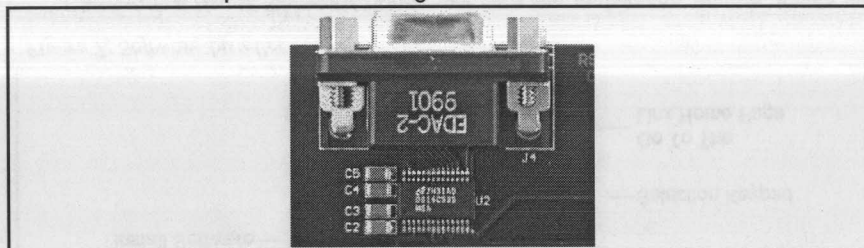


Figure 3: RS232 Section

THE MICROCONTROLLER AREA

The microcontroller section contains a PIC microcontroller from Microchip and demonstrates how to interface the QS Module with a processor. Figure 4 shows the Microcontroller section on the development board and Figure 5 shows the Send and Receive Via USB section in the development software.

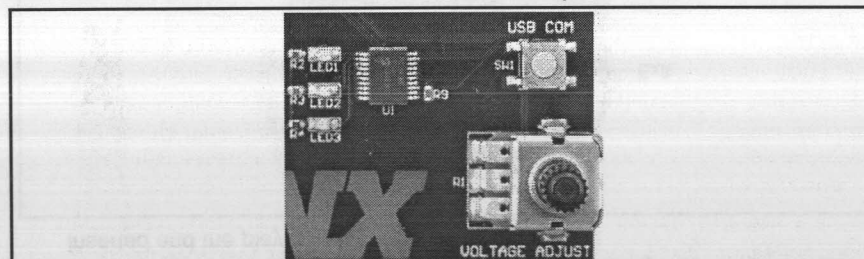


Figure 4: Microcontroller Section

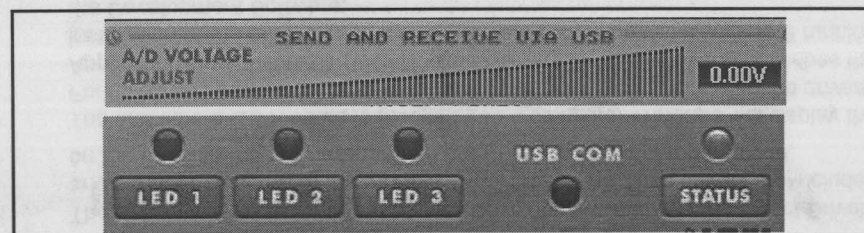


Figure 5: Software Send and Receive via USB Section

THE MICROCONTROLLER AREA (CONT.)

The software will send data to the microcontroller to turn on LEDs when the user clicks the LED1, LED2, or LED3 buttons on the computer screen. The microcontroller will send data to the PC to light up the USB COM indicator on the screen when the USB COM button on the board is pressed. The microcontroller will also send data to control the A/D Voltage Adjust slider when the Voltage Adjust knob on the board is turned. Source code examples are provided with the software documentation to demonstrate the simplicity of interfacing the QS module with a processor and to aid in product development.

The USB bus provides all of the power for this section. To use, plug a USB cable into the Jack and the PC, place the jumper in the breakout header between "Data In" and "Data PIC" and run the application software included with the kit.

THE PROTOTYPING AREA

The prototyping area contains an area of plated through holes so that external circuitry can be placed on the board. This circuitry can be interfaced with the QS module through the breakout header to the right. At the bottom of this area is a row connected to ground and at the top is a row connected to the USB power supply. The circuitry on the development board will draw approximately 40-50mA of current so any circuitry added to the prototype area cannot draw more than 50mA before enumeration, per the USB specification (please see the Power Supply Guidelines in the module's design guide for more information). If the circuitry will require more current, then an external power supply will be required. Resistor R10 is a 0ohm jumper that can be removed to isolate the power supply row from the USB supply enabling the user to attach their own supply to this row.

All of the module's control and data lines are connected to the header allowing easy access from the prototyping area. A jumper is also included to route the data from the RS232 Section or the Microcontroller section to the QS module. It must be appropriately set before the sections will work properly.

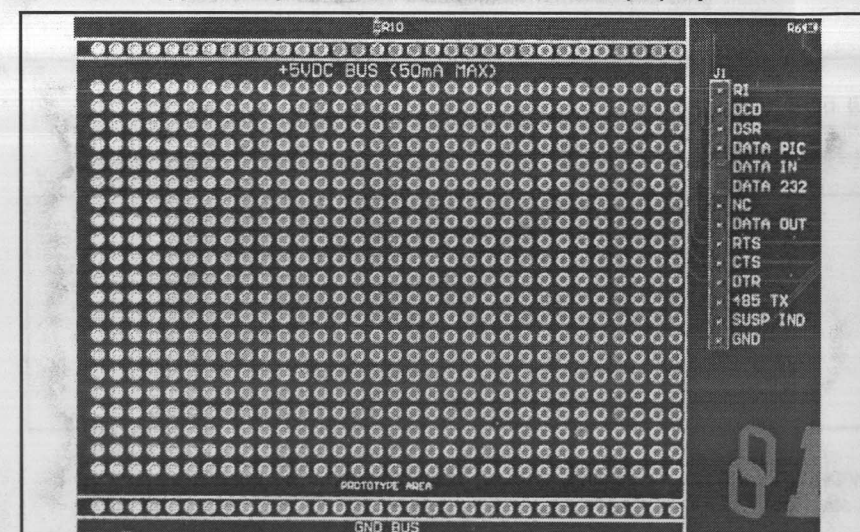


Figure 6: Prototyping Area

INSTALLING THE SOFTWARE AND DRIVERS

The software included with the Master Development Kit uses the Direct Drivers and cannot be used with the Virtual COM Port Drivers. Both drivers are included on the CD with the software, so be sure to choose the appropriate one.

The first time a QS module is plugged into a computer Windows will display the Found New Hardware Wizard, which will guide you through installing the drivers. Application Note AN00201 (Installing the SDM-USB-QS-S Drivers) describes the installation of the drivers in detail. The drivers should be installed before running the Development Software.

The QS Master Development Software will automatically start when the CD is inserted and the player in Figure 7 will appear.

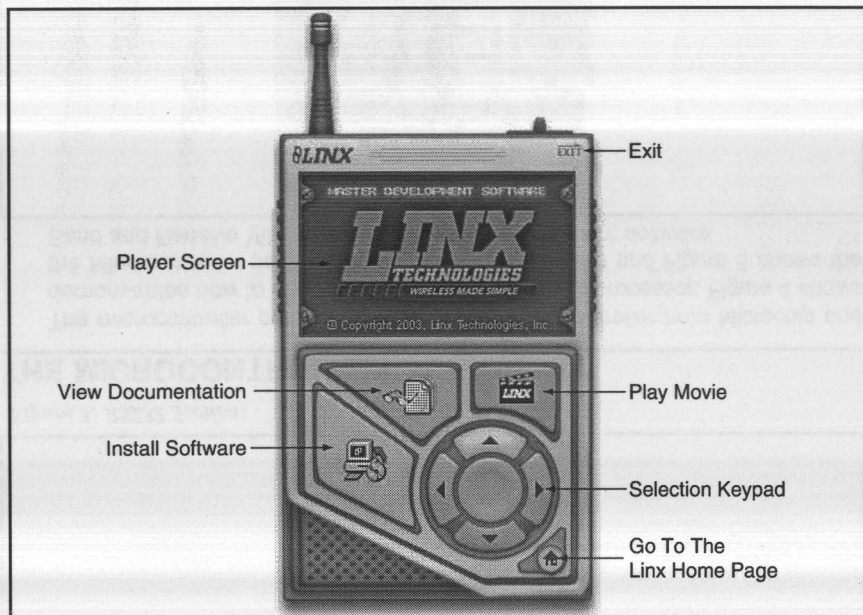


Figure 7: Software Installer

Clicking the **Install Software** button will start the Installation Wizard, which will guide you through the installation of the development software. The **View Documentation** button will show a list of the application notes and manuals related to the QS module. Selecting one of these will open the file in Adobe Acrobat. The **Play Movie** button will play a short video about Linx in the Player screen, which can be controlled with the Selection Keypad. Clicking the button on the bottom right of the player will open the Linx Technologies home page in the computer's default browser.

Options listed in the **View Documentation** list will allow for the installation of Adobe Acrobat Reader so that the documents may be viewed. There is also the option of installing Flash, which may be required if the Linx video does not play correctly.

QS DEVELOPMENT SOFTWARE

When the software is first started, the screen in Figure 8 will ask the user to choose which area of the development board will be used with the QS module, the RS232 or the PIC section.

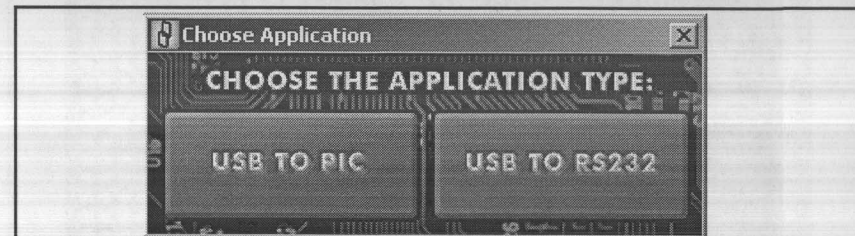


Figure 8: The Choose Application Screen

The Control Panel will then appear, set up for whichever section was selected. The area can be changed by going to the "Window" menu and clicking the appropriate selection.

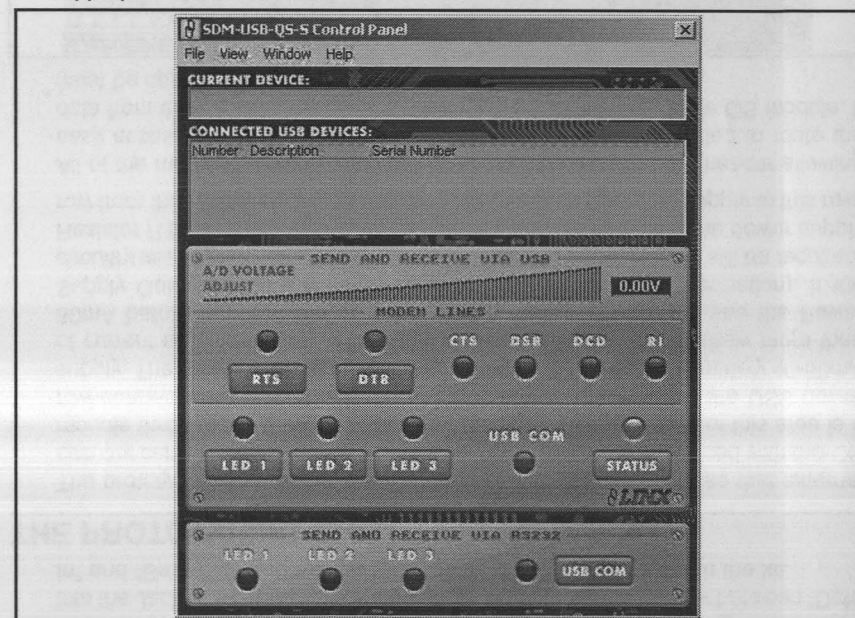


Figure 9: The Control Panel for RS232 Operation

Full documentation for the software and samples of the source code can be found in the help file, obtained by clicking on Help\Help File and selecting either the .pdf file to be displayed in Adobe Acrobat or the .html file to be displayed in the default web browser.

If any problems are encountered, first unplug the module and plug it back in, then check the help file. If your problem is not corrected or addressed, then Linx contact information can be found under the Help/Contact Us menu.

ADDITIONAL RESOURCES FROM LINX

Below is a list of additional resources available on the development kit CD or for download from the Linx web sites: www.linxtechnologies.com or www.instantusb.com. These are intended to give the designer all of the tools needed to quickly and correctly implement the SDM-USB-QS-S module in a product.

Data Guides

- SDM-USB-QS-S USB Module Design Guide
- Application Note AN00200, SDM-USB-QS-S Programmer's Guide
- Application Note AN00201, Installing the Drivers For The SDM-USB-QS-S

Software

- SDM-USB-QS-S EEPROM Programmer
- SDM-USB-QS-S EEPROM Programmer Manual

Drivers

- SDM-USB-QS-S Direct Drivers
- SDM-USB-QS-S Virtual COM Port Drivers

Function Declarations for Custom Software

- SDM-USB-QS-S Visual Basic Header File
- SDM-USB-QS-S C Header File

WEB RESOURCES

For everything about the QS Series USB module, go to www.instantusb.com. This intuitive site is dedicated to the QS Series and is laid out to give you all of the information and tools you need right at your fingertips. Check this page 24/7 for application notes, software updates, and data guides

INSTANT USB
COMPLETE INTERFACE SOLUTION

USB Module Description

The Linx QS Series USB module allows the rapid addition of USB to virtually any device. Housed in a compact SMD package the QS module provides a complete solution for converting between USB and logic level serial sources. The module can be directly connected to virtually any serial device including microprocessors, RS232C/RS485 level converters, or Linx wireless RF modules. The QS module is completely self-contained and requires no external components (except a USB jack) and includes all necessary firmware and drivers, freeing the designer from complicated programming. Power can be supplied externally or from the USB bus. Both USB 1.1 and USB 2.0 are supported at data rates to 30Mbps.

Physical Package
(also for larger module, requires MicroBGA Pin)

Dimensions: 0.812" (20.6mm) x 0.630" (16.0mm) x 0.125" (3.18mm)

TOP VIEW
SIDE VIEW

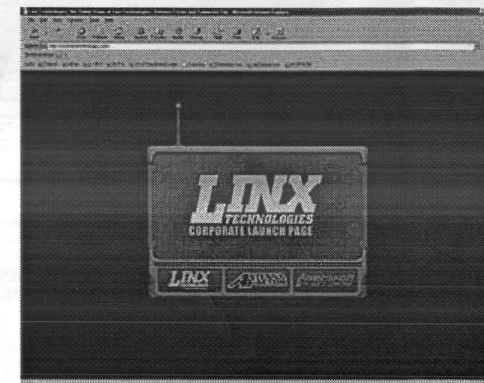
IN CLOSING

Here at Linx, "Wireless Made Simple" is more than just our motto, it is our commitment, a commitment to the highest caliber of product, service, and support. That is why, should you have questions or encounter any difficulties using the Master Development Kit, you'll be glad to know many resources are available to assist you. First, check carefully for the obvious, then visit our website, www.linxtechnologies.com, email info@linxtechnologies.com, or call 800-736-6677 between 8AM and 4PM PST to speak with an application engineer.

ON-LINE RESOURCES



- Latest News
- Data Guides
- Application Notes
- Knowledge Base
- Software Updates



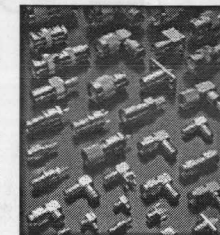
If you have questions regarding any Linx product and have Internet access, make www.linxtechnologies.com your first stop. Our website is organized in an intuitive format to give you the answers you need in record time. Day or night, the Linx website gives you instant access to the latest information regarding the products and services of Linx. It's all here: manual and software updates, application notes, a comprehensive knowledge base, FCC information and much more. Be sure to visit often!



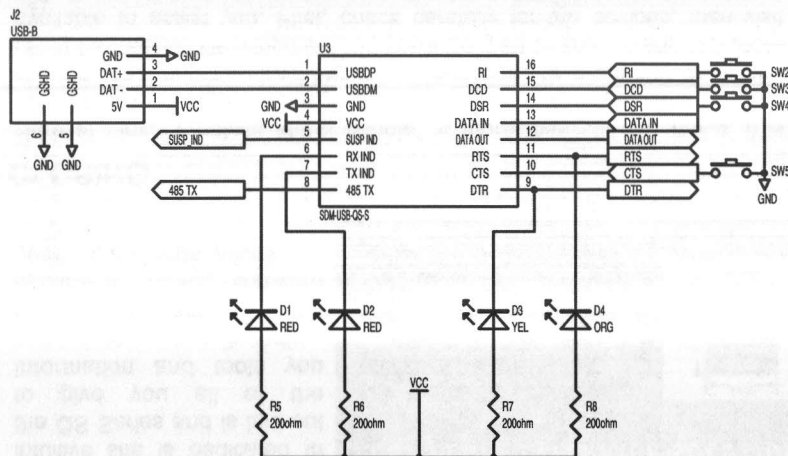
The Antenna Factor division of Linx offers a diverse array of antenna styles, many of which are optimized for use with our RF modules. From innovative embeddable antennas to low-cost whips, domes to yagi's, and even GPS, Antenna Factor likely offers or can design an antenna to meet your requirements.



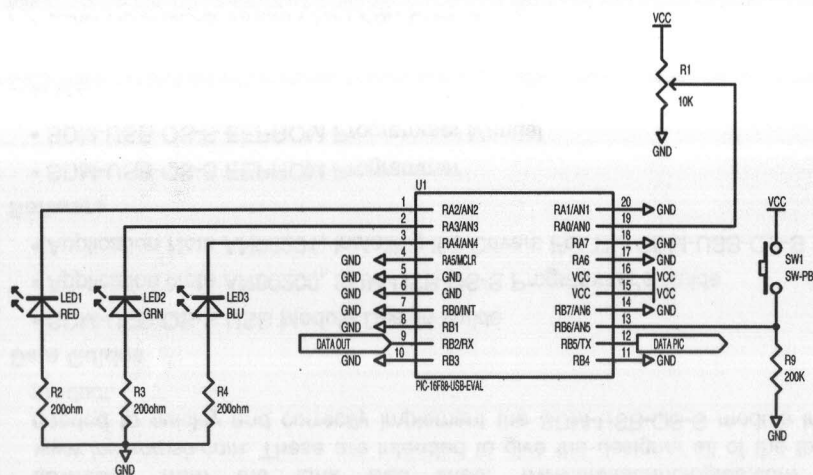
Through its Connector City division, Linx offers a wide selection of high-quality RF connectors, including FCC-compliant types such as RP-SMAs that are an ideal match for our modules and antennas. Connector City focuses on high-volume OEM requirements, which allows standard and custom RF connectors to be offered at a remarkably low cost.



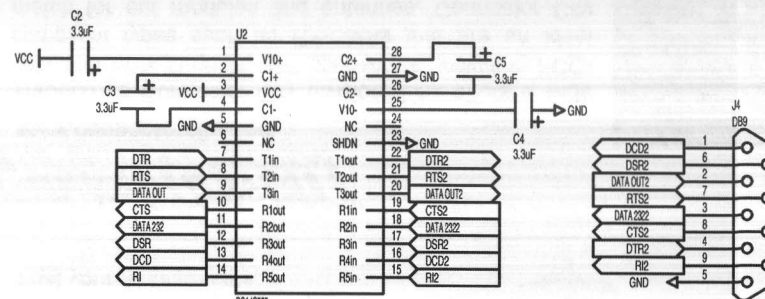
USB SECTION



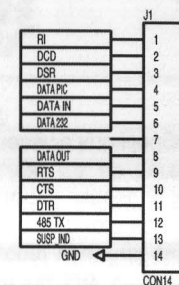
MICROCONTROLLER SECTION



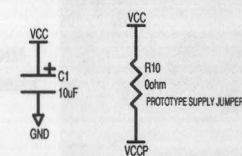
RS232 SECTION



PROTOTYPING AREA HEADER



POWER SUPPLY





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